

CLAIMS

What is claimed is:

1. An electro-magnetic clutch comprising:
an internal gear that is selectively one of fixed and rotatable in response to an electro-magnetic force supplied by an electro-magnetic force generating means;
a first rotational body centrally positioned on an inner side of said rotatable internal gear;
a second rotatable body;
a plurality of gears coupled to said second rotatable body configured so that said plurality of gears engage with and revolve around said first rotatable body when said first rotatable body is rotating; and
wherein when an electro-magnetic force supplied by an electro-magnetic force generating means is applied said internal gear is fixed and said first rotatable body and said second rotatable body are coupled such that torque is transmitted from said first rotatable body to said second rotatable body and when said electro-magnetic force is removed said internal gear is rotatable and said first rotatable body and said second rotatable body are decoupled and torque is not transmitted from said first rotatable body to said second rotatable body.
2. The electro-magnetic clutch of claim 1, wherein said electro-magnetic generating force means is an electro-magnetic solenoid.
3. The electro-magnetic clutch of claim 1, wherein said electro-magnetic generating means is located separately from said first rotatable body, second rotatable body and said internal gear.

4. The electro-magnetic clutch of claim 1, wherein said central gear comprises a sun gear and said sun gear is coupled to a shaft for coupling to a drive source.

5. The electro-magnetic clutch of claim 1, wherein each of said plurality of gears are rotatably coupled to shafts extending from said second rotatable body.

6. An electro-magnetic clutch comprising:
an internal gear that is selectively one of fixed and rotatable in response to an electro-magnetic force supplied by an electro-magnetic force generating means;
a first rotational body centrally positioned on an inner side of said rotatable internal gear;

a second rotatable body;

a plurality of gears coupled to said second rotatable body configured so that said plurality of gears engage with and revolve around said first rotatable body when said first rotatable body is rotating; and

wherein when an electro-magnetic force supplied by an electro-magnetic force generating means is applied said internal gear is rotatable and said first rotatable body and said second rotatable body are decoupled such that torque is not transmitted from said first rotatable body to said second rotatable body and when said electro-magnetic force is removed said internal gear is fixed and said first rotatable body and said second rotatable body are coupled and torque is transmitted from said first rotatable body to said second rotatable body.

7. The electro-magnetic clutch of claim 6, wherein said electro-magnetic generating force means is an electro-magnetic solenoid.

8. The electro-magnetic clutch of claim 6, wherein said electro-magnetic generating means is located separately from said first rotatable body, second rotatable body and said internal gear.

9. The electro-magnetic clutch of claim 6, wherein said central gear comprises a sun gear and said sun gear is coupled to a shaft for coupling to a drive source.

10. The electro-magnetic clutch of claim 6, wherein each of said plurality of gears are rotatably coupled to shafts extending from said second rotatable body.

11. An electro-magnetic clutch comprising:
an internal gear that is selectively one of fixed and rotatable;
a first rotatable body having a central gear;
a second rotatable body; and
a plurality of gears coupled to the second rotatable body, each of the plurality of gears engaging the rotatable internal gear and the central gear of the first rotatable body; wherein when the internal gear is fixed, the second rotatable body is rotated, and when the internal gear is free to rotate, the second rotatable body is fixed.

12. The electro-magnetic clutch of claim 11, wherein said internal gear is selectively one of fixed and rotatable in response to an electro-magnetic force generated by an electro-magnetic solenoid.

13. The electro-magnetic clutch of claim 11, wherein said electro-magnetic solenoid is located separately from said first rotational body, second rotational body and said internal gear.

14. The electro-magnetic clutch of claim 11, wherein said central gear comprises a sun gear and said sun gear is coupled to a shaft for coupling to a drive source.

15. The electro-magnetic clutch of claim 11, wherein each of said plurality of gears are rotatably coupled to shafts extending from said second rotatable body.